uated in a large series of patients (pts) 75 years of age or older. To study the safety and test positivity profile of DSE in such pts, 724 consecutive pts (Group I: 177 pts < 55 yo, Group II: 442 pts 55–74 yo, and Group III:105 pts ≥ 75 yo) were evaluated retrospectively. All pts received incremental IV dobutamine (range: 5 to 55 mcg/kg/min total, mean total: 31 ± 8) with ECG and two-dimensional echocardiography (2DE) recorded at each stage. There was no significant difference (p = NS) in prevalence of test positivity (stress-induced ECG or 2DE abnormalities) among groups (I: 22%; II: 24%; III: 31%). Chest pain occurred more frequently in younger pts(I: 31%; II: 21%; III: 18%, p < 0.01). Although the oldest pts had highest incidence of *asymptomatic* hypotension (I: 7%; II: 13%; III: 25%, p < 0.001), *symptomatic* hypotension was more frequent in Group II (I: 2%; II: 5%; III: 2%, p = 0.0003). Ventricular arrhythmias were seen more frequently in the older pts (I: 25%; II: 30%; III: 40%, p = 0.04), but rarely (< 2%) resulted in test termination. No pt required acute medical intervention. Stress-induced LV wall motion abnormalities (WMA) developed in 15% of Group I, 18% of Group II and 22% of Group III (p = NS). ST-T wave changes alone were 39%, 58% and 70% *sensitive* (p < 0.05: I vs. III, p = NS for other comparisons) and 91%, 93% and 89% *specific* (p = NS between groups), for detecting WMA in Groups I, II and III, respectively.

Conclusion: Although DSE was a safe test in pts ≥ 75 yrs, it had a different safety profile — e.g., more frequent asymptomatic hypotension and ventricular arrhythmias, but less frequent chest pain. There was a similar incidence of test positivity in older and younger pts. In older pts, ECG changes alone offered good specificity and moderate sensitivity — better than in younger pts — for detecting stress-induced WMA. 2DE imaging may be relatively less important in DSE in elderly compared to younger pts.

995-68 Risk Factors for Atherothrombotic Brain Infarction in 664 Elderly Men and 1,488 Elderly Women

Wilbert S. Aronow, Chul Ahn. *Hebrew Hospital Home, Bronx, NY; Mount Sinai School of Medicine, New York, NY*

In a prospective study, we correlated prior atherothrombotic brain infarction (ABI), age, cigarette smoking, hypertension, diabetes mellitus, obesity, serum total cholesterol, high-density lipoprotein (HDL) cholesterol, and triglycerides with the incidence of new ABI in 664 men, mean age 80 ± 8 years, and in 1,488 women, mean age 82 ± 8 years. Mean follow-up was 42 ± 25 months (range 1–129) for men and 48 ± 30 months (range 1–129) for women. New ABI occurred in 140 of 664 men (21%) and in 259 of 1,488 women (17%) (p = 0.043). Multivariate Cox regression model showed that significant independent risk factors for new ABI in elderly men were prior ABI, relative risk (RR) = 2.6; hypertension, RR = 2.2; and diabetes mellitus, RR = 1.5. Marginally significant risk factors for new ABI in elderly men were cigarette smoking (p = 0.065), RR = 1.5; and serum HDL cholesterol (p = 0.059), RR = 0.98. Significant independent risk factors for new ABI in elderly women were prior ABI, RR = 2.9; cigarette smoking, RR = 1.9; hypertension, RR = 2.4; diabetes mellitus, RR = 1.5; serum total cholesterol, RR = 1.005; and serum HDL cholesterol, RR = 0.987. These data show that significant independent risk factors for new ABI were prior ABI, hypertension, and diabetes mellitus in both elderly men and women and cigarette smoking, serum total cholesterol, and serum HDL cholesterol in elderly women.

996 Cardiac Transplantation: Pathophysiology and Therapy

Wednesday, March 27, 1996, 9:00 a.m.–11:00 a.m.
Orange County Convention Center, Hall E
Presentation Hour: 10:00 a.m.–11:00 a.m.

996-1 The Effect of Variations in Dietary Sodium on Plasma Adrenomedullin (ADM) Levels in Cardiac Transplant Recipients

Margaret A. Lloyd, Michihisa Jougasaki, Sharon M. Sandberg, Brooks S. Edwards, John C. Burnett Jr.. *Mayo Clinic, Rochester, MN*

ADM is a recently identified endogenous natriuretic and vasodilating peptide. Prior studies have demonstrated that plasma concentrations of ADM are elevated in patients with CHF and HTN. The plasma concentration of ADM in heart transplant recipients is undefined. Furthermore, the effect of variations in dietary sodium on circulating ADM levels in this group is unknown. We studied controls (N = 5) and heart transplant recipients (N = 6) on strict *in-patient high* (300 mEq/day, 4 days) and *low* (20 mEq/day, 5 days) sodium diets. Transplant recipients were healthy and on stable immunosuppressive regimens. BP and plasma ADM were measured at the end of each period.

Variations in dietary sodium did not significantly affect BP within groups. Plasma ADM was significantly higher in the transplant group compared to controls on both diets. Sodium restriction in the transplant group resulted in further activation of ADM; however, plasma levels of ADM were not sensitive to variations in dietary sodium in the normal group. We conclude that plasma ADM is increased in heart transplant recipients, and circulating levels are related to variations in dietary sodium intake in this group.

	ADM (pg/ml)	Sys BP (mmHg)	Dias BP (mmHg)
Control			
300 mEq	30.8 ± 3.4	111.6 ± 4.8	72.8 ± 4.0
20 mEq	31.1 ± 2.3	100.8 ± 4.2	65.2 ± 1.6
Transplant			
300 mEq	51.1 ± 5.1*	155.5 ± 6.5*	99.5 ± 5.8*
20 mEq	70.5 ± 6.0*†	146.7 ± 4.8*	96.8 ± 6.1*

*p < 0.05 between groups, †p < 0.05 within groups (ANOVA)

996-2 Exercise Capacity Following Neonatal Cardiac Transplantation fc: Hypoplastic Left Heart Syndrome (HLHS)

Neda F. Mutla, Linda H. Feenstra, Joyce K. Johnston, Ranae L. Larsen, Girish S. Shirali, M. A. Ali Khan, Daniel A. Dyar, Richard E. Chinnock, Leonard L. Bailey. *Loma Linda University Children's Hospital, Loma Linda, CA*

The exercise capacity of neonatal cardiac transplant recipients (CTR) for HLHS has not been described. *Objective:* To evaluate their aerobic capacity by exercise testing and compare to normals. *Methods:* Ten CTR patients (pts) and 9 size-matched normals underwent an incremental treadmill test (0.2 mph & 1.5% grade increase per minute) to maximum volition. All reached ventilatory anaerobic threshold (VAT). Flow volume loop evaluation preceded testing. Expired gases were monitored continuously. Analysis was with Student's t-test for independent samples. *Results:* The mean age of CTR pts and normals was 6.7 ± 1.2 and 7.5 ± 1.4 years respectively. The median age at transplant was 22.5 days. The med an number of rejections was 2.5. None had pneumocystis pneumonia or CMV infection. Two CTR pts had abnormal coronary angiograms one of whom had significant ST segment depression at peak exercise. The two groups had no significant differences for age, weight or height. Pulmonary parameters tended to be lower in CTR pts, but were not statistically significant.

	Max. HR (bpm)	Max. VO_2 ml/kg/min	VO_2 at VAT ml/kg/min	Test Time (min)	Breathing Reserve
CTR (n = 10)	165 ± 17	34.8 ± 8	31.4 ± 9	12.0 ± 1.9	0.18 ± 0.13
NL (n = 9)	187 ± 19	43.2 ± 6	36.5 ± 5	13.8 ± 2.3	0.32 ± 0.1
P value	p = 0.68	p = 0.98	p = 0.47	p = 0.63	p = 0.16

Mean ± SD

Conclusions: (1) The aerobic capacity of neonatal cardiac transplant recipients for HLHS is mildly reduced. (2) Although breathing reserve is lower in transplanted pts, there is probably no pulmonary restriction to exercise capacity.

996-3 Course of Neurohormones From Heart Failure to Left Ventricular Assist Device to Cardiac Transplantation

Karen B. James, Patrick M. McCarthy, Adam Bolkowski, Rita Vargo, Robert E. Hobbs, Emmanuel Bravo. *Cleveland Clinic, Cleveland, Ohio*

Downregulation of neurohumoral activation has recently been reported on longterm implantable left ventricular assist device support, paralleling the improved hemodynamics. Our aim was to measure neurohormones in a cohort of heart failure patients from left ventricular assist device through the posttransplant period. In 10 patients (9 male, 1 female), age 49 ± 8 years, neurohormones were drawn at (1) baseline preimplant of left ventricular assist device; (2) at explant/transplantation (95 ± 31 days); and at (3) 40 ± 18 days following cardiac transplantation.

Levels of NE (norepinephrine — pg/ml), E (epinephrine — pg/ml), AII (angiotensin II — U/l), AVP (arginine vasopressin — pg/ml), and ANP (atrial natriuretic peptide — pg/ml) were as follows (mean ± SD):

	NE	E	AII	AVP	ANP
Baseline	2885 ± 1448	3942 ± 7929	131 ± 98	5 ± 4	272 ± 229
Explant	593 ± 441*	310 ± 767	11 ± 13*	1 ± 1*	187 ± 49
Post-transplan	542 ± 520*	34 ± 44*	18 ± 21	3 ± 3	181 ± 89

*p < 0.05 compared with baseline

Conclusion: The marked downregulation in neurohormones seen following left ventricular assist device implant is maintained after cardiac transplantation. Atrial natriuretic peptide falls somewhat but remains elevated, due